



FACULTY OF SCIENCE

ACADEMY FOR COMPUTER SCIENCE AND SOFTWARE ENGINEERING

MODULE **IT00147 - NETWORK INFORMATION SECURITY**

CAMPUS **APK**

EXAM **NOVEMBER 2016**

DATE: 30 NOVEMBER 2016

SESSION 08:30 – 10:30

ASSESSOR(S)

PROF M COETZEE

EXTERNAL MODERATOR

DR L DREVIN (NWU)

DURATION **2 HOURS**

MARKS **80**

NUMBER OF PAGES: 2 PAGES

INSTRUCTIONS: **Answer all the questions.
Structure your answers well.**

QUESTION 1

The only way to protect a client against the evil twin attack is by using 802.1X/EAP. Explain why this is so by describing how the evil twin attack works; what 802.1X/EAP is and finally motivate how it protects against the evil twin attack. Structure your answer according to these aspects.

[20]**QUESTION 2**

When a student moves with a mobile device between parts of the UJ buildings, he/she maintains a secure connection with the wifi network. Explain in detail how this can be achieved. Also describe in detail the role that the pairwise master key (PMK) plays and how this key is derived.

[20]**QUESTION 3**

WPA2 mandates the use of a new protocol called CCMP. CCMP uses the AES block cipher, replacing the RC4 cipher used in wired equivalent privacy (WEP) and temporal key integrity protocol (TKIP). RC4 is a stream cipher, whereas AES is known to be a block cipher. Explain what CCMP is (also give the full name of the acronym) and explain how it is possible to use AES to protect wireless communications.

[10]**QUESTION 4**

Once a client station or access point has been classified as a rogue device, a WIPS (Wireless intrusion prevention system) can effectively contain the attack. Describe what a rogue device is and how these devices can be contained.

[10]**QUESTION 5**

Technology and science-based knowledge are vital in supporting improved outcomes in areas ranging from employment creation opportunities and the building of sustainable human settlements to health and education. Through a large-scale implementation of a Wireless Mesh Network (WMN), the DST (Department of Science and Technology) has demonstrated how lower-cost internet connectivity can be provided to hard-to-reach communities.

Describe Wireless Mesh Network (WMN) focusing on their practical application in South Africa, as well as 802.11s components, architecture and security.

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